ICFFTS 2021 ICAERA 2021

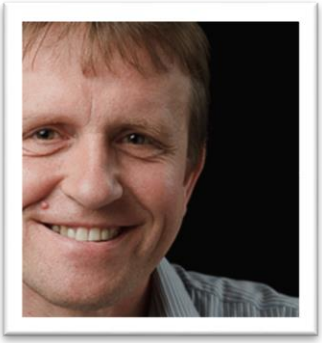
(ICFFTS'21) & (ICAERA'21) PROGRAM

November 24, 2021 - November 26, 2021 | ~~Seoul, South Korea~~
Virtual Conference

OUR PROGRAM SCHEDULE IS BASED ON EASTERN STANDARD TIME (EST - OTTAWA TIME)

November 24 | November 25 | November 26

ICFFTS'21 & ICAERA'21 CHAIRS:



Dr. Boguslaw Kruczek

University of Ottawa, Canada
Conference Chair

Website

Dr. Jiheong Kang

KAIST, South Korea
local Committee Member

Website

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November 24

10:00 AM - 12:00 PM	Registrations

NOVEMBER 25

8:00 AM - 9:00 AM	Registrations
9:00 AM - 9:15 AM	Official Opening
	Dr. Boguslaw Kruczek, University of Ottawa, Canada
9:15 AM - 10:15 AM	ICAERA PLENARY LECTURE
	Perovskite Solar Cell: A Game Changer in Future Solar Power Dr. Nam-Gyu Park, Sungkyunkwan University, South Korea
10:15 AM - 11:00 AM	ICFFTS KEYNOTE LECTURE
	Development and Application of Mesoscopic CFD Methods for Compressible and Thermal Flows Dr. Lian-Ping Wang, Southern University of Science and Technology, China
11:00 AM - 11:10 AM	Break
11:10 AM - 12:25 PM	SESSION CFD I

NOVEMBER 25

12:25 PM - 12:55 PM	**Lunch Break**
12:55 PM - 1:45 PM	**ICFFTS KEYNOTE LECTURE**
	Frontiers in Numerical Optimization of Heat Sinks **Dr. Gerardo Maria Mauro , Università degli Studi del Sannio, Italy**
01:40 PM - 02:25 PM	**SESSION** Newtonian & Non-Newtonian Flow and Heat Transfer

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PLENARY LECTURE

NOVEMBER 25 | 9:10 AM - 10:10 AM | SESSION CHAIR: DR. BOGUSLAW KRUCZEK, UNIVERSITY OF OTTAWA, CANADA

Titles: Perovskite Solar Cell: A Game Changer in Future Solar Power

Dr. Nam-Gyu Park, Sungkyunkwan University, South Korea

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Nam-Gyu Park is Distinguished professor and SKKU-Fellow in School of Chemical Engineering at Sungkyunkwan University (SKKU). He received his B.S. degree in chemical education, M.S. and Ph.D. degrees in chemistry from Seoul National University in 1988, 1992 and 1995, respectively. He worked at ICMCB-CNRS, France, from 1996 to 1997 and at National Renewable Energy Laboratory, USA, from 1997 to 1999 as postdoctoral researchers. He was director of solar cell research center at Korea Institute of Science and Technology (KIST) from 2005 to 2009 and principal scientist at Electronics and Telecommunications Research Institute (ETRI) from 2000 to 2005 before joining SKKU as a full professor in 2009. He is a fellow of Korean Academy of Science and Technology (KAST) since 2017. He has been working on high efficiency mesoscopic nanostructured solar cells since 1997. He is pioneer of solid-state perovskite solar cell, which was first developed in 2012. He was selected as a New Class of Nobel Prize-Worthy Scientist in September 20, 2017 and included in highly cited researchers (HCR, top 1% scientists) in 2017, 2018, 2019 and 2020 by Clarivate Analytics.

For more information Please visit: https://icffts.com/program/

KEYNOTE LECTURE

NOVEMBER 25 | 10:15 AM - 11:00 AM | SESSION CHAIR: DR. BOGUSLAW KRUCZEK, UNIVERSITY OF OTTAWA, CANADA

Titles: Development and Application of Mesoscopic CFD Methods for Compressible and Thermal Flows

Dr. Lian-Ping Wang, Southern University of Science and Technology, China

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Dr. Lian-Ping Wang received a Batchelor's degree in Mechanics from Zhejiang University, Hangzhou, China in 1984, and a PhD in Mechanical Engineering from Washington State University, USA in 1990. He was then a Visiting Research Associate at Brown University from 1990 to 1992, after which he was a Research Associate at Pennsylvania State University from 1992 to 1994 and an Assistant Professor of Mechanical Engineering at the University of Delaware from 1994 to 2001. He became an Associate Professor in 2001 and a Professor in 2010 at the University of Delaware. In 2017, he was appointed a Chaired Professor at Southern University of Science and Technology, China. Dr. Wang's areas of expertise include turbulent multiphase flows, computational fluid dynamics (CFD) in particular mesoscopic CFD methods, and modeling of complex flows. He has published around 142 refereed journal papers and has given over 100 invited talks. Dr. Wang became an elected Fellow of American Physical Society in 2011 and an elected Fellow of American Society of Mechanical Engineers in 2016, and an Invitation Fellow of Japan Society for the Promotion of Science (9/2016 – 3/2017).

SESSION

CFD I

NOVEMBER 25 | 11:10 AM - 12:25 PM | SESSION CHAIR: DR. BOGUSLAW KRUCZEK, UNIVERSITY OF OTTAWA, CANADA & DR. GERRY SCHNEIDER, UNIVERSITY OF WATERLOO, CANADA

Titles: Numerical Solution for Inertial Corner Flows in a Fluid Superposed Porous Layer

ICFFTS 112
Time: 11:10 AM - 11:25 AM
Presenter: Abhijit Verma, Indian Institute of Science Bangalore, India
Authors: Abhijit Verma

Titles: Analysis of Vorticity Distribution in a Closed Partially Porous Domain

ICFFTS 114
Time: 11:25 AM - 11:40 AM
Presenter: Abhijit Verma, Indian Institute of Science Bangalore, India
Authors: Abhijit Verma

Titles: Convective Heat Transfer inside a Rotating Cylinder Experiencing an Axial Air Flow

ICFFTS 117
Time:11:40 AM - 11:55 AM
Presenter: Desmond Adair, Nazarbayev University, Republic of Kazakhstan
Authors: Desmond Adair, Bakhtiyar Kalzhan

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CFD I

NOVEMBER 25 | 11:10 AM - 12:25 PM | SESSION CHAIR: DR. BOGUSLAW KRUCZEK, UNIVERSITY OF OTTAWA, CANADA & DR. GERRY SCHNEIDER, UNIVERSITY OF WATERLOO, CANADA

Titles: Heating and Evaporation of Droplets on a Super-hydrophobic Surface: Preliminary Results

ICFFTS 120
Time: 11:55 AM - 12:10 PM
Presenter: Dmitrii Antonov, National Research Tomsk Polytechnic University, Russia
Authors: Dmitrii Antonov, Roman Fedorenko, Pavel Strizhak, Sergei S. Sazhin

Titles: Evaluation Of Mass Transfer And Interfacial Area Correlations In Direct Contact Packed-Bed: Comparison Of Correlations

ICFFTS 118
Time:12:10 PM - 12:25 PM
Presenter: Mahyar Abedi, Michigan State University, USA
Authors: Mahyar Abedi, Parnab Saha, Xu Tan, James F. Klausner, Andre Benard

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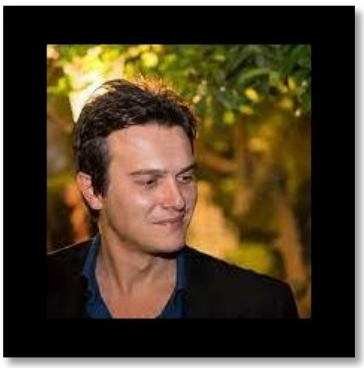
KEYNOTE LECTURE

NOVEMBER 25 | 12:55 PM - 01:40 PM | SESSION CHAIR: DR. GERRY SCHNEIDER, UNIVERSITY OF WATERLOO, CANADA



Titles: Frontiers in Numerical Optimization of Heat Sinks

Dr. Gerardo Maria Mauro, Università degli Studi del Sannio, Italy

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Gerardo Maria Mauro was born in Benevento on May 12, 1988. He is Assistant Professor at “Università degli Studi del Sannio”, Department of Engineering, since December 2018. His main research topics concern: i) numerical simulation and optimization of building energy design or retrofit; ii) large-scale analysis of building stocks via machine/deep learning; iii) development and optimization of strategies for the model predictive control of energy systems; iv) investigation of innovative building components for 3d printing; iv) advanced modeling and optimization of heat transfer systems via numerical methods and machine/deep learning. He is author of more than 50 scientific publications at international level. Five of them have been “highly cited papers” according to ISI Web of Science. According to SCOPUS database (November 2021) he has H-Index equal to 19 and 1296 citations. He is Editorial Board Member of the MDPI Journals “Sustainability”, “Energies” and “Buildings”. He is Reviewer of more than 20 international Journals published by Elsevier, Taylor & Francis, MDPI and Springer. He participates to different national and European research projects.

SESSION

NEWTONIAN & NON-NEWTONIAN FLOW AND HEAT TRANSFER

NOVEMBER 25 | 01:40 PM - 02:25 PM | SESSION CHAIR: DR. SERGEI SAZHIN, UNIVERSITY OF BRIGHTON, UNITED KINGDOM

Titles: Stability Of Vertical Double-Diffusive Interfaces In The Presence Of Material Diffusion

ICFFTS 115
Time: 01:40 PM - 01:55 PM
Presenter: Khaled Al Mashrafi, A'Sharqiyah University , Oman
Authors: Khaled Al Mashrafi

Titles: Prediction Of Head Degradation Of A Centrifugal Pump Handling Power-Law Fluid

ICFFTS 105
Time: 01:55 PM - 02:10 PM
Presenter: Péter Csizmadia, Budapest University of Technology and Economics, Hungary , Oman
Authors: Péter Csizmadia, Dávid Lajos Lukácsi, Sára Till

Titles: The Fluid Dynamics of Rising and Evaporating Droplet in an Immiscible Liquid

ICFFTS 101
Time: 02:10 PM - 02:25 PM
Presenter: Abdullah Abbas Kendoush, Augusta Technical College, USA
Authors: Abdullah Abbas Kendoush

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NOVEMBER 26

9:00 AM - 9:45 AM	**ICFFTS KEYNOTE LECTURE**
	Lattice Boltzmann and Gas Kinetic Flux Solvers and Their Applications **Dr. Chang Shu, National University of Singapore, Singapore**
9:45 AM - 10:30 AM	**ICFFTS KEYNOTE LECTURE**
	Manipulating Solid-Liquid Interfacial Interactions for Designing Surfaces with Special Wettability for Separation Processes **Dr. Gibum Kwon, University of Kansas, USA**
10:30 AM - 10:40 PM	**Break**
10:40 AM - 12:15 PM	**SESSION** Renewable & Sustainable Energies
12:15 AM - 12:45 AM	**Lunch Break**
12:45 PM - 01:30 PM	**ICAERA KEYNOTE LECTURE**
	In-Stream Hydrokinetic Turbines for Sustainable Energy Conversion **Dr. Michele Guala, University of Minnesota, USA**
01:30 PM - 03:15 PM	**SESSION** CFD II

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KEYNOTE LECTURE

NOVEMBER 26 | 9:00 AM - 9:45 AM | SESSION CHAIR: DR. JIHEONG KANG, KAIST, SOUTH KOREA

Titles: Lattice Boltzmann and Gas Kinetic Flux Solvers and Their Applications

Dr. Chang Shu, National University of Singapore, Singapore

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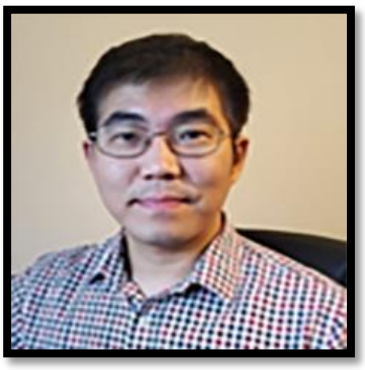
Dr Chang Shu is a Professor at the Department of Mechanical Engineering, National University of Singapore. He got his BEng and MEng respectively in 1983 and 1986 from Nanjing University of Aeronautics and Astronautics, China, and his PhD in 1991 from the University of Glasgow, UK. Dr Shu has been working in the computational Fluid Dynamics (CFD) for more than 35 years. His major interest is to develop efficient numerical methods to solve heat transfer and fluid flow problems, which are governed by a set of partial differential equations. Recently, he developed a series of flux solvers, which are based on the lattice Boltzmann equation and Boltzmann equation. These solvers can be well applied to simulate fluid flows from incompressible regime to hypersonic regime on structured and unstructured meshes. He also made effort to develop some efficient models for simulation of multiphase flows and flows around moving boundaries. So far, he has authored 4 monographs and published more than 350 articles in the international referred journals (SCI indexed). His work has been cited more than 20000 times in Google Scholar.

KEYNOTE LECTURE

NOVEMBER 26 | 09:45 AM - 10:30 AM | SESSION CHAIR: DR. JIHEONG KANG, KAIST, SOUTH KOREA



Titles: Manipulating Solid-Liquid Interfacial Interactions for Designing Surfaces with Special Wettability for Separation Processes

Dr. Gibum Kwon, University of Kansas, USA

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Gibum Kwon is an assistant professor of Department of Mechanical Engineering at the University of Kansas. He received his Ph.D. in Materials Science and Engineering from the University of Michigan – Ann Arbor in 2014, where he developed separation methodologies for liquid-liquid mixtures with a research advisor Professor Anish Tuteja. During his Ph.D., he was awarded Materials Research Society (MRS) Graduate Student Silver Award and Rackham Predoctoral Fellowship (2013). From 2014 to 2016, he worked as a Postdoctoral Associate at MIT. At MIT, he conducted research on the wettability switching of photo-responsive semiconducting materials upon light illumination with Professors Gareth H. McKinley and Kripa K. Varanasi. In 2016, he joined the Department of Mechanical Engineering at the University of Kansas as an assistant professor. He is a recipient of NSF CAREER award (2020), Wesley G. Cramer Award (2020), and Hanwha Young Faculty award (2021). He has co-authored 20 refereed journal articles, as well as 8 patents of which 2 have been licensed.

SESSION

RENEWABLE & SUSTAINABLE ENERGIES

NOVEMBER 26 | 10:40 AM - 12:15 AM | SESSION CHAIR: DR. ABDULLAH A. KENDOUSH, AUGUSTA TECHNICAL COLLEGE, USA & DR. DESMOND ADAIR, NAZARBAYEV UNIVERSITY, KAZAKHSTAN

Titles: Fuel Efficiency Improvement of Rule-based Algorithm for P0 Mild Hybrid Electric Vehicle

ICAERA 105
Time: 10:40 AM - 10:45 AM
Presenter: In-Gyu Jang, Sungkyunkwan University, Korea
Authors: In-Gyu Jang, Sung-Ho Hwang

Titles: Techno-Enviro-Economic Assessment of a Solar Powered Cooler for Cauliflower Storage in Nanded District, India

ICAERA 111
Time: 10:45 AM - 11:00 AM
Presenter: Jimena Díaz, University of Guanajuato, Constantine, Mexico & Prashant Govande, Shri Guru Gobind Singh Ji Institute of Engineering and Technology, India
Authors: Jimena Díaz, Prashant Govande, Kapil Narwal, Paul G. O'Brien

Titles: Performance Optimization of the Gasification Process by using Equilibrium Model and Dragonfly Algorithm

ICAERA 115
Time: 11:00 AM - 11:15 AM
Presenter: Adityabir Singh, Indian Institute of Technology Ropar, India
Authors: Adityabir Singh, Ranjan Das

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RENEWABLE & SUSTAINABLE ENERGIES

NOVEMBER 26 | 10:40 AM - 12:15 AM | SESSION CHAIR: DR. ABDULLAH A. KENDOUSH, AUGUSTA TECHNICAL COLLEGE, USA & DR. DESMOND ADAIR, NAZARBAYEV UNIVERSITY, KAZAKHSTAN

Titles: Stability Analysis of Salt-gradient Solar Pond under External Heat Addition with Different Salts
ICAERA 112
Time: 11:15 AM - 11:30 AM
Presenter: Abhishek Kumar,Indian Institute of Technology Ropar, India
Authors: Abhishek Kumar, Ranjan Das

Titles: Producing Electricity By Concentrated Solar Energy

ICAERA 102
Time: 11:30 AM - 11:45 AM
Presenter: Hassan Abdulmouti, HCT, UAE
Authors: Hassan Abdulmouti

Titles: Life Cycle Assessment of Using Solar Streetlights for Municipal Streetlighting

ICAERA 113
Time: 11:45 AM - 12:00 PM
Presenter: Paul O'Brien, York University, Canada
Authors: Quinn Daigle, Ijaz Rauf, Paul O'Brien

Titles: Characterization of Adsorbents for Thermal Energy Storage in Residential Heating Applications

ICAERA 114
Time: 12:00 PM - 12:15 PM
Presenter: Kapil Narwal, York University Canada
Authors: Kapil Narwal, Roger Kempers, P. G. O'Brien

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KEYNOTE LECTURE

NOVEMBER 26 | 12:45 PM - 01:30 PM | SESSION CHAIR: DR. GERRY SCHNEIDER, UNIVERSITY OF WATERLOO, CANADA

Titles: In-Stream Hydrokinetic Turbines for Sustainable Energy Conversion Processes

Dr. Michele Guala, University of Minnesota, USA

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Michele Guala is an associate professor in the Department of Civil, Environmental and Geo Engineering, graduate faculty in the Department of Mechanical Engineering, and the Associate Director for Research at the St. Anthony Falls Laboratory, University of Minnesota.

SESSION

CFD II

NOVEMBER 26 | 1:30 PM - 3:15 PM | SESSION CHAIR: DR. BOGUSLAW KRUCZEK, UNIVERSITY OF OTTAWA, CANADA & DR. ABDULLAH A. KENDOUSH, AUGUSTA TECHNICAL COLLEGE, USA

Titles: An Immersed Boundary Projection Method for Complex Fluid-Structure-Interaction Simulation
ICFFTS – Invited Speaker
Time: 1:30 PM – 02:00 PM
Presenter: Weixi Huang, Tsinghua University, China
Authors: Weixi Huang, Luo-Hao Wang

Titles: Finite-time Lyapunov Exponent analysis used on a free-surface flow problem solved by Smoothed Particle Hydrodynamics
ICFFTS 108
Time: 02:00 PM - 2:15 PM
Presenter: Petr Jančík, Czech Technical University, Czech Republic
Authors: Petr Jančík, Tomáš Hyhlík

Titles: Investigating the impact of Longitudinal and Lateral Distances on the Lift and Drag Coefficients of two Closely Moving Vehicles

ICFFTS 113
Time: 02:15 PM - 2:30 PM
Presenter: Gerry Schneider, University of Waterloo, Canada
Authors: Mohammadreza Saber Ashkezari, Ali Mohammad, Masoud Darbandi, Gerry E. Schneider

Titles: Dependency of Purge Duration of an Atomic Layer Deposition Process on the Outlet Size of a Viscous Flow Reactor

ICFFTS 109
Time: 2:30 PM- 02:45 PM
Presenter: Betelhiem N. Mengesha, University of the District of Columbia, USA
Authors: Betelhiem N. Mengesha, Mohammad Reza Shaeri

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CFD II

NOVEMBER 26 | 1:30 PM - 3:15 PM | SESSION CHAIR: SESSION CHAIR: DR. BOGUSLAW KRUCZEK, UNIVERSITY OF OTTAWA, CANADA & DR. ABDULLAH A. KENDOUSH, AUGUSTA TECHNICAL COLLEGE, USA

Titles: Design and CFD Simulation of Interior Wind Guides for the Four Dry Cooling Towers of Shazand Power Plant to Improve the Performance of Cooling System in Critical Peak Hours

ICFFTS 119
Time: 02:45 PM- 3:00 PM
Presenter: Gerry Schneider, University of Waterloo, Canada
Authors: Masoud Darbandi, Kazem Mashayekh, Pooya Javadpour-Langroodi, Fakhereh Seyedi, Gerry E. Schneider, Shahram Iranpak, Javad Farhadi

Titles: Modulation of a R245fa Supersonic Ejector By A Movable Needle: A Numerical Study

ICFFTS 121
Time: 03:00 PM- 3:15 PM
Presenter: Charles P. Rand, Université de Sherbrooke, Canada
Authors: Charles P. Rand, Sergio Croquer, Michel Poirier, Sébastien Poncet

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